# Findings of IPCC Special Report on Climate Change and Land on food security

www.ipcc.ch/report/SRCCL



Prajal Pradhan Potsdam Institute for Agricultural Climate Impact Research (PIK) Koronivia Workshop, UNFCCC Climate Dialogues 01.12.2020

Agricultural landscape between Ankara and Hattusha, Anatolia, Turkey (40°00' N – 33°35' E) ©Yann Arthus-Bertrand | www.yannarthusbertrand.org | www.goodplanet.org



INTERGOVERNMENTAL PANEL ON Climate change

## **CLIMATE CHANGE AND LAND**

An IPCC Special Report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems. INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE

## **Climate Change and Land**

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Summary for Policymakers





REPORT COVER IMAGE: Agricultural landscape between Ankara and Hattusha, Anatolia, Turkey (40°00' N – 33°35' E) ©Yann Arthus-Bertrand | www.yannarthusbertrand.org | www.goodplanet.org





# Food and Agriculture

- 821 million people are currently undernourished and 2 billion adults are overweight or obese.
- The food system is **under pressure** from non-climate stressors (e.g., population and income growth, demand for animal-sourced products), and from climate change.
- Climate change is **already affecting food security** through increasing temperatures, changing precipitation patterns, and frequency of some extreme events. This will continue.
- Distributions of pests and diseases will change, affecting production negatively in many regions.
- Food security & climate change have **strong gender dimensions**.
- Many practices can be optimised and scaled up to advance adaptation throughout the food system.





Climate change is making a challenging situation worse and undermining food security.



### Different socioeconomic pathways affect levels of climate related risks (figure 2B)

Socio-economic choices can reduce or exacerbate climate related risks as well as influence the rate of temperature increase.

- Risks related to food security are greater in pathways with lower income, increased food demand, increased food prices resulting from competition for land, more limited trade, and other challenges to adaptation (e.g., SSP3).
- For food security, the transition from moderate to high risk occurs for global warming between 2.5°C and 3.5°C in SSP1 and between 1.3°C and 1.7°C in SSP3.
- The transition from high to very high risk occurs between 2°C and 2.7°C for SSP3.

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GMST change relative to levels in pre-industrial time (°C)



## Food and Emissions

- 25-30% of total Greenhouse gas emissions are attributable to the food system.
- Supply-side practices can help mitigate climate change mitigation by reducing crop and livestock emissions, absorbing carbon in soils and biomass, and decreasing emissions intensity within sustainable production systems.
- Consumption of **balanced diets** presents major opportunities for **reducing emissions** from food systems and **improving health outcomes**.
- Reduction of food loss and waste could lower emissions and improve food security.

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• Policies, markets, institutions, and governance are needed to enable change.





Agriculture, food production, and deforestation are major drivers of climate change.



The way we produce our food matters; dietary choices can help reduce emissions and pressure on land.



## Food system response options

Mitigation and adaptation potential

Ve	ry high	High			
Lir	nited	////// None	Response options	Mitigation	Adaptatio
			Increased soil organic matter content		
			Change in crop variety		
			Improved water management		
į			Adjustment of planting dates	1//////	
			Precision fertiliser management		
n n n			Integrated pest management	1//////	
2			Counter season crop production	(///////	
2			Biochar application		
2			Agroforestry		
2			Changing monoculture to crop diversification		
	Changes in cropping are	a, land rehabilita	tion (enclosures, afforestation) perennial farming		
			Tillage and crop establishment		
			Residue management		
			Crop–livestock systems		

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	Silvopastural system		
	New livestock breed		
OCK	Livestock fattening		
vest	Shifting to small ruminants or drought-resistant livestock or fish farming		
agir	Feed and fodder banks		
nan	Methane inhibitors		1//////
	Thermal stress control		
_	Seasonal feed supplementation		
	Improved animal health and parasites control		
es	Early warning systems	1//////	
rvic	Planning and prediction at seasonal to intra-seasonal climate risk	1//////	
se	Crop and livestock insurance	///////	





Food storage infrastructures Shortening supply chains Improved food transport and distribution Improved efficiency and sustainability of food processing, retail and agrifood industries Improved energy efficiencies of agriculture Reduce food loss Urban and peri-urban agriculture Bioeconomy (e.g. energy from waste) **Dietary changes** Reduce food waste Packaging reductions New ways of selling (e.g. direct sales) Transparency of food chains and external costs



management

Demand

Improved supply chain



There are **actions** available to us that can simultaneously improve land, enhance food security and improve nutrition.



#### IPCC INTERGOVERNMENTAL PANEL ON CLIMATE CHARGE

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Website: http://ipcc.ch IPCC Secretariat: ipcc-sec@wmo.int IPCC Press Office: ipcc-media@wmo.int WG III TSU: tsu@ipcc-wg3.ac.uk

#### PRAJAL PRADHAN

Potsdam Institute for Climate Impact Research (PIK) pradhan@pik-potsdam.de @prajdhan



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**Purple**: Very high probability of severe impacts/ risks and the presence of significant irreversibility or the persistence of climate-related hazards, combined with limited ability to adapt due to the nature of the hazard or impacts/risks.

**Red**: Significant and widespread impacts/risks. **Yellow**: Impacts/risks are detectable and attributable to climate change with at least medium confidence. **White**: Impacts/risks are undetectable.

